AMENDMENTS TO THE CLAIMS:

1-32. (Cancelled).

33. (Previously presented) A fluid flow measuring and proportional fluid flow control device comprising:

a proportional flow valve having a fluid inlet and a fluid outlet;

an actuator for said proportional flow valve;

a restrictive flow element having a restrictive flow element fluid inlet and a restrictive flow element fluid outlet in fluid communication with said fluid inlet of said proportional flow valve, said restrictive flow element creating a pressure drop between said restrictive flow element fluid inlet and restrictive flow element fluid outlet;

means for measuring said pressure drop;

a controller in connection with said means for measuring said pressure drop and said actuator, the controller operable to:

calculate a flow rate based on said pressure drop;

apply fuzzy logic rules to a change in flow rate over time (dF/dt) and a flow rate error; and

determine how much to modulate said proportional fluid flow valve based on the application of fuzzy logic rules to the change in flow rate and flow rate error.

34. (Previously presented) The device of claim 33, wherein said controller is further operable to:

compare a flow rate error to a first set of membership functions to generate a first set of fuzzy inputs; and

compare a change in flow rate over time (dF/dt) to a second set of membership functions to generate a first set of second set of fuzzy inputs;

wherein each fuzzy input from the first set of fuzzy inputs ad the second set of fuzzy inputs is associated with an input degree of truth.

35. (Previously presented) The device of Claim 34, wherein said controller is further operable to apply a first set of rules to the first set of fuzzy inputs and the second set of fuzzy

inputs to generate a set of fuzzy outputs, wherein each fuzzy output is associated with an output degree of truth.

36. (Previously presented) The device of Claim 34, wherein the controller is operable to:

associate each fuzzy output with a discrete change in valve output;

calculate the overall change in valve output based on the output degree of truth of one or more of the fuzzy outputs and the discrete change in valve output value associated with each of the one or more fuzzy outputs.

37. (Previously presented) The device of Claim 34, wherein said restrictive flow element creates a parasitic pressure drop.

38. (Previously presented) The device of Claim 34, wherein the restrictive flow element comprises a venturi.

39. (Previously presented) The device of Claim 34, further comprising means for sensing temperature of said fluid, and wherein said controller corrects said calculated flow rate in response to said sensed temperature.

40. (Previously presented) The device of claim 34, wherein said means for measuring said pressure drop comprises a first pressure transducer for sensing pressure of said fluid upstream of said venture and a second pressure transducer for sensing pressure of said fluid in the most restrictive part of a venturi.

41. (Previously presented) The device of Claim 33, further comprising a positioning sensor on said actuator valve.

42. (Previously presented) The device of Claim 33, wherein said restrictive flow element recovers at least 10 percent of the measured pressure drop.

43. (Previously presented) The device of Claim 33, wherein said controller uses stored fluid property data to measure and control fluid flow.

44-49. (Cancelled).

50. (Previously presented) A fluid flow measuring and proportional fluid flow control device comprising:

a proportional flow valve having a fluid inlet and a fluid outlet;

an actuator for said proportional flow valve;

a restrictive flow element having a restrictive flow element fluid inlet and a restrictive flow element fluid outlet in fluid communication with said fluid inlet of said proportional flow valve, said restrictive flow element creating a pressure drop between said restrictive flow element fluid inlet and restrictive flow element fluid outlet;

an upstream pressure sensor and a downstream pressure sensor;

a controller in communication with said upstream pressure sensor and said downstream pressure sensor, said controller operable to:

receive an upstream pressure signal;

receive a downstream pressure signal;

calculate a flow rate based on said upstream pressure signal and said downstream pressure signal;

apply fuzzy logic rules to a change in flow rate over time (dF/dt) and a flow rate error; and

determine how much to modulate said proportional fluid flow valve based on the application of fuzzy logic rules to the change in flow rate and flow rate error.

51. (Previously presented) The device of claim 50, wherein said controller is further operable to:

compare a flow rate error to a first set of membership functions to generate a first set of fuzzy inputs; and

compare a change in flow rate over time (dF/dt) to a second set of membership functions to generate a first set of second set of fuzzy inputs;

wherein each fuzzy input from the first set of fuzzy inputs ad the second set of fuzzy inputs is associated with an input degree of truth.

52. (Previously presented) The device of Claim 51, wherein said controller is further operable to apply a first set of rules to the first set of fuzzy inputs and the second set of fuzzy

inputs to generate a set of fuzzy outputs, wherein each fuzzy output is associated with an output degree of truth.

53. (Previously presented) The device of Claim 52, wherein the controller is operable to:

associate each fuzzy output with a discrete change in valve output;

calculate the overall change in valve output based on the output degree of truth of one or more of the fuzzy outputs and the discrete change in valve output value associated with each of the one or more fuzzy outputs.

54. (Currently Amended) The device of Claim 53, wherein the controller ~~is~~ further comprises a valve driver operable to generate a valve drive signal based on a valve control signal, wherein the valve control signal is based on the change in valve output.

55-60. (Cancelled).